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Performance Oriented Packaging Testing of CNU-240/E SPARROW Guidance and Control Section Container for Packing Group II Solid Hazardous Materials

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13. ABSTRACT (*Maximum 200 words*)

Qualification tests were performed to determine whether the in-service CNU-240/E SPARROW Guidance and Control Section Container, Drawing 2605437, could be utilized to contain properly dunnaged solid type hazardous materials weighing up to a gross weight of 181 kg (400 pounds). The tests were conducted in accordance with Performance Oriented Packaging (POP) requirements specified by the United Nations Recommendations on the Transportation of Dangerous Goods and the Department of Transportation's Title 49 CFR and the Final Rulings published in the Federal Register, Vol. 55 on 21 Dec 90. The container has conformed to the POP performance requirements; i.e., the container successfully retained its contents throughout the specified tests.

14 SUBJECT TERMS	15. NUMBER OF PAGES
POP Test of CNU-240/E SPARROW Guidance and Control Section Container	6
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17 SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
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PERFORMANCE ORIENTED PACKAGING TESTING OF CONTAINER, SPARROW GUIDANCE AND CONTROL SECTION, CNU-240/E FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS

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7 November 1991

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INTRODUCTION

The CNU-240/E SPARROW Guidance and Control Section Container tested, contained a simulated load of 123.3 kg (272 pounds) of sand representing the worst case of loading. Weight of the loaded container was 181.4 kg (400 pounds). This Performance Oriented Packaging (POP) test was performed to ascertain whether this standard container (Packing Group II) would meet the requirements as specified by the United Nations Recommendation on the Transportation of Dangerous Goods Document, ST/SG/AC.10/1, Revision 6, Chapters 4 and 9 and Title 49 CFR 107 dated 1 October 1991. A base level vibration test was also conducted in accordance with the final rulings specified in the Department of Transportation's Performance Oriented Packaging Standards in the Federal Register Volume 55. Due to unavailability, the number of containers used was less than the number required by the regulations. This has been approved by the Under Secretary of Defense, Memorandum for the Joint Logistics Commanders dated 22 February 1990.

The objectives of these tests were to minimize the risk of personnel or environmental exposure to the hazards associated with the contents in the advent of a transportation or handling accident.

TESTS PERFORMED

1. Base Level Vibration Test

This test was performed in accordance with Title 49 CFR 107, Part 178, Subpart M, Sec. 178.608. One sample container was placed on the repetitive shock platform. The container was restrained during vibration in all but the vertical direction. The frequency of the platform was increased until the container left the platform 1/16 of an inch at some instant during each cycle. Test time was 1 hour at a frequency of 3.5 Hz.

2. Stacking Test

This test was performed in accordance with Title 49 CFR 107, Part 178, Subpart M, Sec. 178.606. One container was used for this test. A container was subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a height of 3 meters (including the test sample). A weight of 725.6 kg (1,600 pounds) was stacked on the sample container. The test was performed for 24 hours. After the allowed time, the weight was removed and the container examined.

3. Drop Test

This test was performed in accordance with Title 49 CFR 107, Part 178, Subpart M, Sec. 178.603. One container was used throughout the test. Five drops were performed from a height of 1.2 meters (4 feet), impacting the following surfaces:

a. Flat bottom

b. Flat top

c. Flat on long side

d. Flat on short side

e. One corner

All tests were performed at an ambient temperature of +70 ± 20 °F.

PASS/FAIL (UN CRITERIA)

1. Base Level Vibration Test (HM-181 CRITERIA)

The criteria for passing the base level vibration test is outlined in Title 49 CFR 107, Sec. 178.608(c): "A packaging passes the vibration test if there is no rupture or leakage from any of the packages."

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR 107, Sec. 178.606(d): "No test sample may leak. In composite packagings or combination packagings, there must be no leakage of the filling substance from the inner receptacle, or inner packaging. No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength or cause instability in stacks of packages.

3. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR 107, Sec. 178.603(f): A package is considered to successfully pass the drop tests if for each sample tested--

(1) For removable head drums for solids, the entire contents are retained by an inner packaging (e.g., a plastic bag) even if the closure on the top head of the drum is no longer sift-proof;

(2) For a composite or combination packaging, there is no damage to the outer packaging likely to adversely affect safety during transport, and there is no leakage of the filling substance from the inner packaging;

(3) For a drum, jerrican or bag, any discharge from a closure is slight and ceases immediately after impact with no further leakage;

(4) For packagings for explosives, no rupture of the packaging occurs.

TEST RESULTS

1. Base Level Vibration Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Drop Test

Satisfactory.

DISCUSSION

1. Base Level Vibration Test

Immediately after the vibration test was completed, each container was removed from the platform, turned on its side and observed for any evidence of leakage. No leakage was observed as a result of this test.

2. Stacking Test

Each container was visibly checked after the 24-hour period was over. No leakage, distortion, or deterioration was observed as a result of this test.

3. Drop Test

After each drop, the containers were inspected for any evidence of leakage. No leakage was observed as a result of this test. Seven of the 14 latches came unlatched and two broke off but the contents did not spill out.

REFERENCE MATERIAL

A. United Nation's "Recommendation on the Transportation of Dangerous Goods," ST/SG/AC.10/1, Revision 6

B. Title 49 CFR 107, et al., Performance Oriented Packaging Standard; Changes to Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative

C. Bureau of Explosives Tariff No. BOE 6000K Hazardous Materials Regulations of the Department of Transportation by Air, Rail, Highway, Water including Specifications for Shipping Containers

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TEST DATA SHEET

DATA SHEET:	
Container: CNU-240/E SPARROW Guidance and Control Section Container	
Type: 4B1	**Container P/N or NSN:** NSN 8E 8140-01-006-0504
Specification Number: Drawing 2605437	**Material:** Draw formed aluminum
Gross Weight: 181.4 kg (400 pounds)	**Dimensions:** 90.312" L x 21.218" W x 20.520" H
Closure (Method/Type): Latch	**Tare Weight:** 55.9 kg (123 pounds)
Additional Description:	
PRODUCT:	
Name: See table	**NSN(s):** See table
United Nations Number: See table	
United Nations Packing Group: II	
Physical State (Solid, Liquid, or Gas): Solid	
Vapor Pressure (Liquids Only): N/A	**At 50 °C:** N/A **At 55 °C:** N/A
Consistency/Viscosity: N/A	**Density/Specific Gravity:** N/A
Amount Per Container:	**Flash Point:** N/A
Net Weight: See table	
TEST PRODUCT:	
Name: Sand	**Physical State:** Solid
Consistency: N/A	
Density/Specific Gravity: N/A	
Test Pressure (Liquids Only): N/A	
Amount Per Container: N/A	**Net Weight:** 125 kg (277 pounds)

TABLE 1
CNU-240/E SPARROW Guidance and Control Section Container

NALC	NSN	Type	Packing Drawing	UN Code	UN Number	#/ Cntr	Weight (lb)
PM40	1427-01-034-3406	Guidance Control Group	P/N 2605437	1.4S	1046	1	213
PM42	1427-01-049-5498	Guidance Control Section	P/N 2605437	2.2	1046	1	213
PM43	1427-01-049-5499	Guidance Control Section	P/N 2605437	2.2	1046	1	161.6
PM44	1427-01-049-5500	Guidance Control Group	P/N 2605437	2.2	1046	1	161.6
PM45	1427-01-049-5501	Guidance Control Section	P/N 2605437	2.2	1046	1	161.6
PM46	1427-01-068-3184	Guidance Control Section	P/N 2605437	2.2	1046	1	213
PM47	1427-01-068-3185	Guidance Control Section	P/N 2605437	2.2	1046	1	161.6
PM48	1427-01-072-3601	Guidance Control Section	P/N 2605437	2.2	1046	1	213
PM49	1427-01-072-3602	Guidance Control Group	P/N 2605437	2.2	1046	1	161.6
PM50	1427-01-072-3603	Guidance Control Section	P/N 2605437	2.2	1046	1	213
PM51	1427-01-072-3604	Guidance Control Section	P/N 2605437	2.2	1046	1	161.6
PM52	1427-01-093-7405	Guidance Control Group	P/N 2605437	2.2	0349	1	161.6
PM59	1427-01-274-7145	Guidance Control Section	P/N 2605437	2.2	1046	1	190
PM61	1427-01-274-7144	Guidance Control Section	P/N 2605437	2.2	1046	1	252
PM63	1427-01-287-2149	Guidance Control Section	P/N 2605437	2.2	1046	1	250

CNU-240/E SPARROW GUIDANCE AND CONTROL SECTION CONTAINER
POP MARKING

UN 4B1/Y181/S/**/USA/DOD/NAD

** YEAR LAST PACKED OR MANUFACTURED

Encl (2)